

STUDIES IN CYPERACEAE IN SOUTHERN AFRICA: III

Two New Species of *Fimbristylis* Vahl

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ABSTRACT

Two new species of *Fimbristylis* Vahl are described for Southern Africa. *F. hygrophila* has affinities with section *Abildgaardia* Vahl, while *F. variegata* shows relationship with section *Fuscae* Ohwi. The distribution of the former species is known to extend to Tropical Africa.

***Fimbristylis hygrophila* Gordon-Gray sp. nov.**

Perennis, erectus, vel paullo languidus, ad 44 cm. longus, caespitosus: *rhizoma* ligneum, contractum, manifestum fruticeto abrupto, ad 5 mm. latum, latitudine omni modo, saepe oblique perpendiculus in solo, luridus vel fuscus foliis leviter spongiosis efficiens tunicam rhizomati: *folia* solum vaginarum; vaginae solidae, solide vestientes culmo rotundae, molle, spongiosa, glabrae, multis nervis, anastomosis prope os antequam incedunt diminuta laminas; carina non perspicua; membranacea pars interdum deficiente, plerumque minuta triangula maculosa area ad basim vaginae oris et ad marginem declivi oris; *ligula* brevis membranacea margo vaginae oris adaxialis ad laminas; *laminae* obsoletae, ad 3 mm. longae, filiforme, apiculatae, glabrae, tandem caducae: *culmi* manifesti, plerumque erecti, interdum leviter languidi, rotundi languidi striati, glaber: *pars inflorescens* mutabilis, ad 23 mm. in longitudinem, ad 35 mm. in latitudinem, ex umbella simplici composita unius spicae sessilis cum 1—4 pedicellatis spicis additis, vel cum uno capite 4—2 sessilium spicarum, vel capitis 2—4 spicarum cum 1—4 pedicellatis capitibus, vel pedicellatis spicis additis, vel unius sessilis spicae solum; omnibus vel nonnullis facultatibus repraesentatis in singularibus plantis; pedicelli ad 10 mm. longi, similes culmis inflorescentibus sed complantiores; *bracteae* 2—4, ad 5 mm. longae, nunquam magis pars inflorescens, simile squamis sed minores cum apiculo, ad 2 mm. longo; *spicae* 10—22 mm. longae, 3—9 mm. latae, oblongae vel oblonge-lanceolatae, densae in immaturitate, ellipticae vel ovatae, lacerae in senectute, in inferior ex partis languide compressae, aliter rotundae, lucentes luridae vel flavae, inferiores squamae premature caducae; *rachilla* manifeste tortuosa; breviter alatae; alae non manifestae, mox marcescentes, fuscae, maculosae:

squamae imbricatae, solide vestientes rachillas in immaturitate, mox patentes et facientes spicam laceram, infimae 1—2 infecundae, similes bracteis, reliquae fecundae, 6·1—8·2 mm. longae, 3·2—4·3 mm. latae, naviculare, ovatae, glabrae, flaventes; margo luridus, membranosus, conspicuus sum aridus; carina rotunda manifeste cum arida, cum tribus nervis excurrentibus in mucronatum; apex acutus, mucronatus, mucro ad 1 mm. longus in squamis inferioribus: *stamina* 3; *anthera* 2·5—3·3 mm. longa, flava vel lurida cum fuscis, longitudinis maculis; crista pyramidata, fusca, cum minutis auriculari; *stylus* 5·3—7·1 mm. longus includens styli basem, triquetra vel languida alata; iugi pilosi in superiore parte, glabri in inferiore parte, luridi vel fusci; *styli basis* breviter pyramidata, 0·5—0·6 mm. longa cum tribus alis manifestis, margines facierum patentes super apicem nucis fusci, *rami styli* 3, aequalis stylus; *nux* 1·2—1·4 mm. longa, 0·8—1·1 mm. lata, triquetra, late obovata similis piro cum ungula brevi, nivea, *superficies* languida reticulata, manifesta transversa striata, *cellulae exteriorae* subquadratae, transverse elongato super iuga.

TYPE LOCALITY: Natal, Port Shepstone distr.: Port Edward, in damp black mud of vlel opposite Post Office; alt. approx. 30 ft.; collected January, 1951; K. D. Huntley 701 (NU holotype: NU, K, BM, L, PRU, NBG, PRE, BOL isotypes).

ZAMBIA. Chingola distr.: 11 km. n. of Chingola. *Robinson* 4224 (NU, EARO); Luanshya distr.: Ibenga, 18 ml. s. of Luanshya, *Robinson* 3316 (NU, EARO).

TRANSVAAL. Barberton distr.: Mhlambanyati Pan, *Michelmores* 49 (PRE).

NATAL. Ingwavuma distr.: Black Rock area, *Tinley* 307 (NPGF, NU); n.e. Maputa near P.E.A. border, *Ward* 3233 (NPGF, NU); Kosi Bay, *Meyer* s.n. (NU); Hlabisa distr.: w. of Charter's Creek, *Ward* 2794 (NU, NPGF); near Fanie's Island, *Ward* 1479 (NU, NH, NPGF); e. shores St. Lucia, *Ward* 1482 (NU, NH, NPGF); do. *Feely & Ward* 14 (NPGF); Mtunzini distr.: slopes of Ongoye above Ongoye Mission, *Bayer* s.n. (NU); Durban distr.: Clairmont, *Schlechter* 3132 (K, GRA); Stainbank Nature Reserve, Coedmore, *Ward* 4822 (NU, IU); Port Shepstone distr.: Port Edward, *Ward* 3491 (NU, NPGF); Trafalgar, *McNeil* 137 (NU); Uvongo Beach, *Gordon-Gray* 4499 (NU).

Perennial, erect or slightly drooping, up to 44 cm. in height, densely tufted: *rhizome* woody, contracted, conspicuous only when tufts broken apart, up to 5 mm. wide of uniform thickness throughout, usually obliquely vertical in soil, clothed by pale yellow to light brown rather spongy leaf bases, forming, usually, a persistent tunic to rhizome: *leaves* limited to sheaths only; *sheaths* entire, closely investing flowering stems, rounded, soft, spongy, glabrous, many nerved, nerves anastomosing near mouth before passing into reduced blade, keel undefined, membranous portion occasionally wanting, usually limited to

small triangular, brown-speckled portion at base of sheath mouth and margin of sloping mouth; *ligule* short membranous margin of sheath mouth adaxial to blade; *blades* obsolete, never exceeding 3 mm. long, filiform, the apiculate continuation of main nerves of sheath, glabrous, eventually deciduous: *flowering stems* conspicuous, usually erect, occasionally slightly drooping, terete, faintly ridged and furrowed, glabrous: *inflorescence* variable, up to 23 mm. long, by 35 mm. wide, a simple "umbel" of one sessile spikelet with 1—4 pedicelled spikelets added, or a single head of 2—4 sessile spikelets, or a head of 2—4 sessile spikelets with 1—4 additional pedicelled heads or pedicelled spikelets added, or 1 sessile spikelet only, all, or several possibilities being represented on single plants; *pedicels* up to 10 mm. long, as flowering stems but more compressed; *bracts* 2—4, up to 5 mm. long, never exceeding inflorescence, glume-like with apiculus up to 2 mm. long: *spikelets* 10—22 mm. long, 3—9 mm. broad, slightly compressed in lower half otherwise cylindric, oblong to oblong-lanceolate, compact when young, elliptic to ovate, ragged in age, biscuit to golden yellow, shining, basal glumes early deciduous; *rachilla* appearing twisted, wings short, inconspicuous, soon drying, shrivelling and appearing absent, brown with darker speckles: *glumes* addressed to rachilla in young spikelets, soon spreading at 45° giving spikelet ragged outline, lowest 1—2 sterile, bract-like, remainder fertile 6·1—8·2 mm. long, 3·2—4·3 mm. in total width, ovate, glabrous, golden yellow with broad, pallid, faintly brown-speckled, membranous margin obvious when dry, keel rounded, well marked especially when dry, of 3 green to cream nerves excurrent into mucron, up to 1 mm. long in lowest glumes, apex acute, mucronate: *stamens* 3; *anthers* 2·5—3·3 mm. long, yellow to cream with dark brown longitudinal markings, crest pyramidal, clearly defined, dark brown: *style* 5·3—7·1 mm. long including style base, 3 angled to slightly winged, angles long ciliate to villous in upper $\frac{2}{3}$, glabrous below, pallid to brown, *style base* shortly pyramidal, approx. 0·5—0·6 mm. long, markedly 3 winged, bases of flat faces wing-like extending over apex of nut, mid to dark brown, branches 3, approx. equalling style, brown to dark brown: *achene* 1·2—1·4 mm. long, 0·8—1·1 mm. broad, trigonous, broadly obovate almost pyriform, apex shortly projecting; narrowed base (claw) short, approx. $\frac{1}{4}$ total nut length, crystalline white, with greenish brown of testa discernable through pericarp, *surface* faintly reticulate, markedly transversely ribbed; *outermost cells to pericarp* subquadrate, transversely elongate over ridges. *Flowering period* August to March inclusive.

The specific name refers to the form of the vegetative organs which are characteristically those of a marsh species. The winged style base and the undeveloped leaf blades, both distinctive features of the taxon, have already been reflected in names previously applied within the genus.

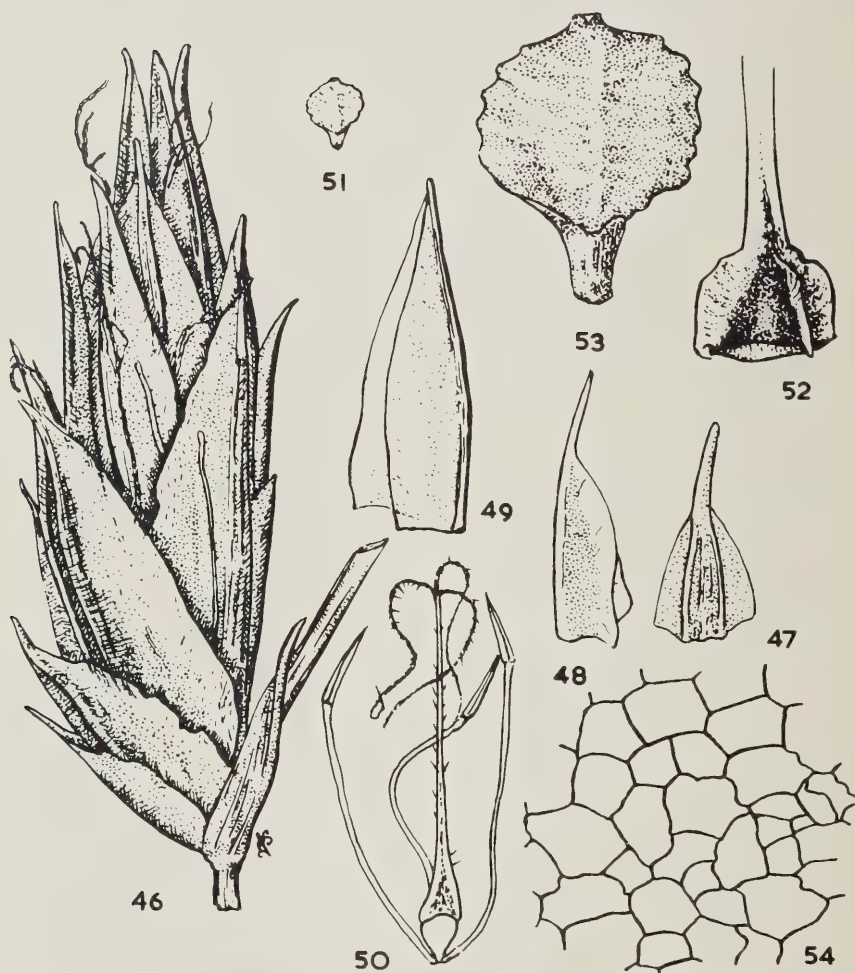


FIG. 1. *Fimbristylis hygrophila* Gordon-Gray sp. nov. (Huntley 701) 46, spikelet; 47, 48, two basal glumes; 49, fifth glume from spikelet base; 50, young floret; 51, achene (all $\times 10$); 52, style and style base ($\times 20$); 53, achene ($\times 40$); 54, epidermal cells to pericarp ($\times 280$).

In August, 1893, Schlechter (3132) collected the species from Clairmont, near Durban, Natal. It was named *F. monostachyos* (L.) Hassk. with the result that it remained apparently unnoticed. On the sheet of Schlechter 3132 in Albany Museum, Schonland wrote, "vidi Wood 10428, 'Maritzburg, alt. 2-3,000 ft.'". The two specimens do not match, however, for Wood 10428 is a fairly robust example of *F. monostachyos*. A subsequent gathering of the new species in 1941, Michelmores 49, remained unidentified, but material collected from Lusikisiki in 1947 by Acocks was also named *F. monostachyos*.

Subsequent field investigation, particularly by C. J. Ward, has revealed that the taxon is well represented along the south eastern African coast from Kosi Bay in the north to the Transkei in the south. Recently specimens were found by Mr. Ward at Coedmore, very close indeed to Schlechter's original locality.

Michelmores's gathering is of interest, for the locality, "Mhlambanyati Pan", is probably in the vicinity of the river of that name in the Transvaal, rather than near Hlambanyati in Swaziland. Whichever is correct, this specimen extends the known distribution for the species further inland than has been recorded in Natal and forms a tenuous link with the specimens collected from dambos in Zambia by E. A. Robinson in 1960-61.

It is probable that the distribution of *F. hygrophila* in Africa, south of the Sahara, follows that of so many tropical sedges, namely across the continent in the tropics, becoming restricted to the coastal plain with increasing southerly latitude and eventually reaching the limit of distribution in South Africa about the mouth of the Great Fish River. For *F. hygrophila*, the hiatus between Zambia and the Transvaal, or Swaziland, remains to be bridged, while distribution north of Zambia remains completely unknown.

In Southern Africa, plants appear confined to sandy, black turf soils of vlei areas where abundant, sometimes more or less stagnant and slightly saline, water of the high water table is available for the major part of the year. Slightly drier conditions can be withstood, provided these do not persist indefinitely. In such vlei areas the species is often dominant, sometimes forming pure stands in lower lying parts. More commonly it occurs together with other sedges, particularly *Fimbristylis complanata* (Retz.) Link and grasses, for example, *Sporobolus subtilis* Kunth.

In Zambia the species seems confined to dambos.

In Northern Rhodesia the species seems confined to dambos.

Among Southern African species, *F. hygrophila* is most closely related to *F. monostachyos* and *F. triflora* (L.) K. Schum. In the mature state it is readily distinguished from these, however, by a number of well marked characters, namely, the well developed rhizome growing, as a rule, obliquely vertically in the soil and clothed by soft, spongy, persistent leaf bases; the undeveloped

leaf blades; the biscuit to golden yellow glumes that on close inspection show broad, pale brownish membranous margins; the tendency of the glumes to project from the rachilla at approximately forty-five degrees giving the spikelet a ragged appearance; the well developed three winged style base that fits closely over the nut apex, so that its three flat faces form three thin "curtains" of tissue overspreading the apical portion of the achene; the clearly marked transverse waving of the upper portion of the achene.

When immature, these features, particularly of spikelets and achenes, are not well marked and confusion with *F. monstachyos* and *F. triflora* is more readily possible.

Until world species have been considered, when closer affinities may be found for *F. hygrophila*, this species is best placed in section *Abildgaardia*, (Pax, 1889; Kern, 1955), together with *F. monstachyos* and *F. triflora*, on the basis of the slight flattening of the spikelet in its basal half, the colour and texture of the glumes, the development of wings to the style base and the pyriform nut.

***Fimbristylis variegata* Gordon-Gray sp. nov.**

Perennis, erectus vel paullo languidus, ad 45 cm. longus, caespitosus: *rhizoma* ligneum, contractum, plerumque manifestum fruticeto abrupto vel persistentibus vaginis tritis, ad 5 mm. latum, latitudine omni modo, saepe oblique perpendiculus in solo, nonnunquam transversus, luridus vel rubidus foliis leviter spongiosis efficiens tunicam rhizomati tandem detritus: *folia* solum vaginarum; vaginae solide vestientes culmo rotundae, interdum obscure carine, molle, leviter spongiosa, glabrae, multis nervis anastomosis prope os antequam incedunt diminuta laminas; carina languide evoluta; membranacea pars plerumque deficiente, interdum minuta triangula area ad basim vaginae oris et ad marginem declivis oris; *ligula* brevis membranacea margo vaginae oris adaxialis ad laminas; *laminae* obsoletae, ad 3 mm. longae, filiforme, apiculatae glabrae: *culmi* manifesti, plerumque erectis, interdum leviter languidi, rotundi, vel paullo complanatis infra umbellam cum iugis et sulcis, glaber: *pars inflorescens* ad 12 mm. in longitudinem, ad 11 mm. in latitudinem, plerumque unico capite 2—9 solide sessilibus vel sub-sessilibus spicis, interdum 2 vel pluris pedicellatis spicis efficiens diminutam simplicem umbellam, vel capita reducta ad unum sessilem spicem, omnibus facultatibus repraesentatis in singularibus plantis; pedicelli simile culmis sed tenuiores; *bractae* 2—3, ad 3 mm. longae nunquam magis inflorescentes, simile squamis sed minores, cum apiculo ad 1.5 mm. longo, pallido; *spicae* 6.0—8.2 mm. longae, 2.2—3.1 mm. latae, angustae ovatae vel ellipticis, densae in inferior ex partis compressae aliter rotundae, interdum compressae omni modi lucentes rufae cum rubidis maculis, basis squamae tarde caducae: *rachillae* tortuosae, languide alatae, rubidae, nuces

plerumque persistente post casum squamarum: squamae imbricatae, infimae 1—2 infecundae, reliquae fecundae 3·5—3·9 mm. longae, 2·3—2·6 mm. latae, naviculare, ovatae, glabrae, flaventes vel fulvae cum rubidis maculis; margo luridus membranaceus conspicuus cum aridus, carina rotunda cum 3-nervis fulvis vel luridis excurrentibus in apicem acutum, mucronatum, mucro ad 0·5 mm. longus in squamis inferioribus brevior in superioribus; *stamina* 3, *anthera* 1·6—2·2 mm. longa, fulvacum rubidis maculis, vel rubida; crista linearis vel oblonga papillata cum basi auriculari: stylus 2·3—2·5 mm. longus includens styli basi, triangulatus vel paullo alatus, apex cilatus in angulum, basis glabra lurida vel fusca; *styli basis* breviter pyramidalis, 0·3 mm. longa, triangulata vel triangularata; bases alarum patentes et legentes apicem nucis: *rami styli* 3, aequale styli vel superans stylum, fusci: *nux* 1·1—1·3 mm. longa, 0·7—0·8 mm. lata, triquetra obovata, lurida vel rufa, *superficies* languida transverse et longitudine striata, *cellulae exteriorae* transverse elongato disposita in lineo perpendiculo.

TYPE LOCALITY: Natal, Port Shepstone distr.: Port Edward, Izingolweni Rd., in shallow soil on ledge of sandstone outcrop on ridge inland from Port Edward village; alt. approx. 300 ft.; collected January, 1951; K. D. Huntley 734 (NU holotype: NU, K, BM, L, PRU, NBG, PRE, BOL isotypes).

NATAL. Port Shepstone distr.: Oribi Flats, *McClellan* 380 (NH, PRE).

CAPE PROVINCE: Bizana distr.: Sea View near Redoubt, *Ward* 1108, 1115 (NU).

Perennial, erect or slightly drooping, up to 45 cm. in height, densely tufted: rhizome woody, contracted, conspicuous only when tufts broken apart, or when persistent leaf sheaths wear away, up to 5 mm. in diameter, of uniform thickness throughout, frequently obliquely vertical in soil, sometimes transverse, clothed by pale to reddish brown, slightly spongy leaf bases forming tunic to rhizome, eventually wearing away: *leaves* limited to sheaths only; *sheaths* closely investing flowering stems, rounded, occasionally indistinctly keeled, soft, slightly spongy, glabrous, many nerved, nerves anastomosing near mouth before passing into reduced blade, keel poorly developed, membranous portion usually wanting, occasionally limited to minute triangular area at base of sheath mouth and margin of sloping mouth; *ligule* short membranous margin of sheath mouth adaxial to blade; *blades* obsolete, up to 3 mm. long, filiform, the apiculate continuation of main nerves of sheath, glabrous: *flowering stems* usually erect, occasionally slightly drooping, terete to slightly flattened below inflorescence, ridged and furrowed, glabrous: *inflorescence* up to 12 mm. long, up to 11 mm. broad, usually a single head of 2—9 closely packed sessile, or sub-sessile, spikelets, occasionally 2 or more spikelets pedicelled forming a reduced simple “umbel”, or heads reduced to one sessile spikelet, all possibilities represented on single plants; *pedicels* as flowering stems, more slender;

bracts 2—3, up to 3 mm. long, never exceeding inflorescence, glume-like but apiculi up to 1.5 mm. long: *spikelets* 6.0—8.2 mm. long, 2.2—3.1 mm. wide, compact, compressed in lower half, otherwise cylindric, occasionally compressed throughout, narrowly ovate to elliptic, shining buff to light brown with chestnut red markings, basal glumes tardily deciduous; *rachilla* straight, scarcely winged, chestnut red, nuts often persisting after glumes are shed: *glumes*, lowest 1—2 sterile, bract-like, remainder fertile, 3.5—3.9 mm. long, 2.3—2.6 mm. in total width, ovate, glabrous, golden yellow to buff with chestnut red markings,

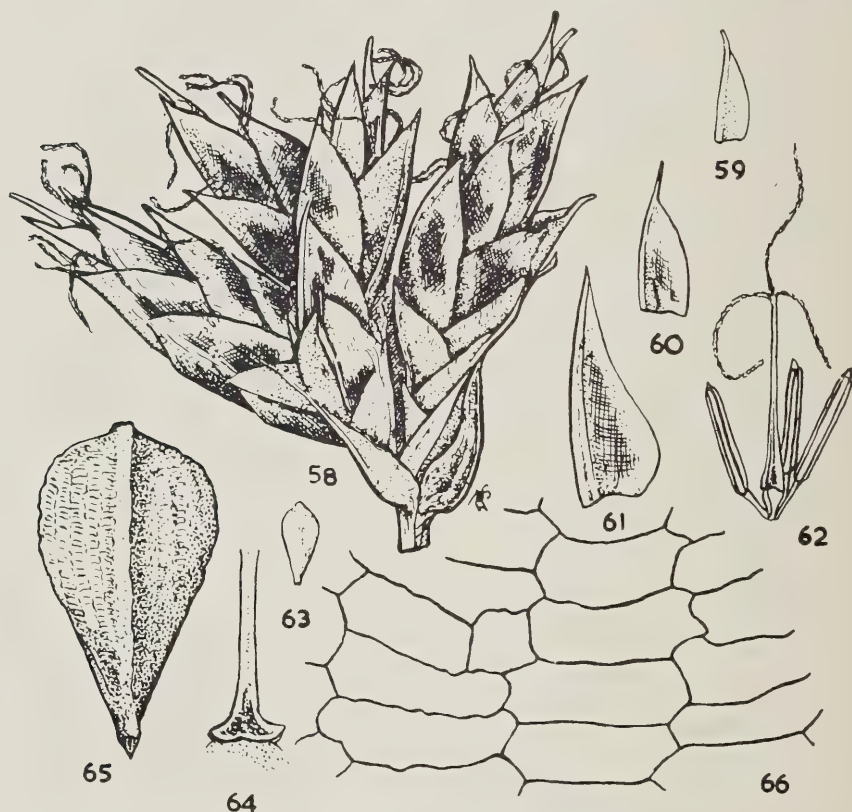


FIG. 2. *Fimbristylis variegata* Gordon-Gray sp. nov. (Huntley 734) 58, single head of four spikelets; 59, 60, two basal glumes; 61, fifth glume from spikelet base; 62, young floret; 63, achene (all $\times 10$); 64, style and style base ($\times 20$); 65, achene ($\times 40$); 66, epidermal cells to pericarp ($\times 280$).

margin pallid, membranous, conspicuous when dry, keel rounded, of 3 yellow to buff nerves excurrent into mucron up to 0.5 mm. long in basal glumes, shorter in upper, apex acute, mucronate: *stamens* 3; *anthers* 1.6—2.2 mm. long, golden brown with chestnut red markings, or chestnut red, crest linear to oblong, clearly defined, papillate; style 2.3—2.5 mm. long including style base, 3-angled to slightly winged, angles ciliate in upper $\frac{2}{3}$, glabrous below, pallid to brown, *style base* shortly pyramidal, approx. 0.3 mm. long, 3-angled to 3-winged, bases of angles prolonged, wing-like, overlying apex of nut, branches 3, equalling or slightly exceeding style, dark brown: *achene* 1.1—1.3 mm. long, 0.7—0.8 mm. wide, trigonous, obovate, apex rounded, cream to pale brown, *surface* faintly transversely and longitudinally striated: *outermost cells to pericarp* transversely elongate, placed in vertical series. Flowering period December to April according to present knowledge.

The specific name refers to the golden buff and chestnut red variegation of the glumes, which gives the spikelet a speckled appearance.

The first collection of the species appears to have been in 1937 by McClean (380) from Oriibi Flats, near Port Shepstone, Natal. The two sheets of this number each bear the comment, "nearest *F. complanata* Link var. *kraussiana*, but not matched exactly."

In form of the achene and shape of its epidermal pericarp cells, there is affinity with *F. complanata*, but this is not well substantiated by other features of structure.

Closer relationship is with *F. hygrophila* sp. nov., but this also is not particularly well marked. Vegetative organs are closely alike, except that leaf bases in *F. variegata* are more slender, less spongy and reddish brown when young. Floral parts, with the exception of the nut, are considerably smaller than in *F. hygrophila* and differ in many details of structure so that these organs supply a number of features whereby the two species may be distinguished, namely, achene shape, size and colour, and form of the epidermal pericarp cells; spikelet, glume and anther size; style base form.

Following Kern, (1955) the species must be placed in section *Fuscae* because of the slight flattening of the spikelet in its basal half, due to a distichous arrangement of lower glumes, and the obovate nut, which, however, is not particularly small. Should this arrangement persist after consideration among world species, *F. variegata* will be the first Southern African representative of this section.

HERBARIUM ABBREVIATIONS

The Herbarium abbreviations used are those listed by Lanjouw and Stafleu (1964). In addition the following abbreviations are also included:

NPGF—Herbarium of the Natal Parks, Game and Fish Preservation Board, Hluhiuwe Game Reserve, Zululand.

IU—Herbarium of the University College, Salisbury Island, Durban, Natal.

EARO—Private Herbarium, E. A. Robinson Esq., Lusaka, Zambia.

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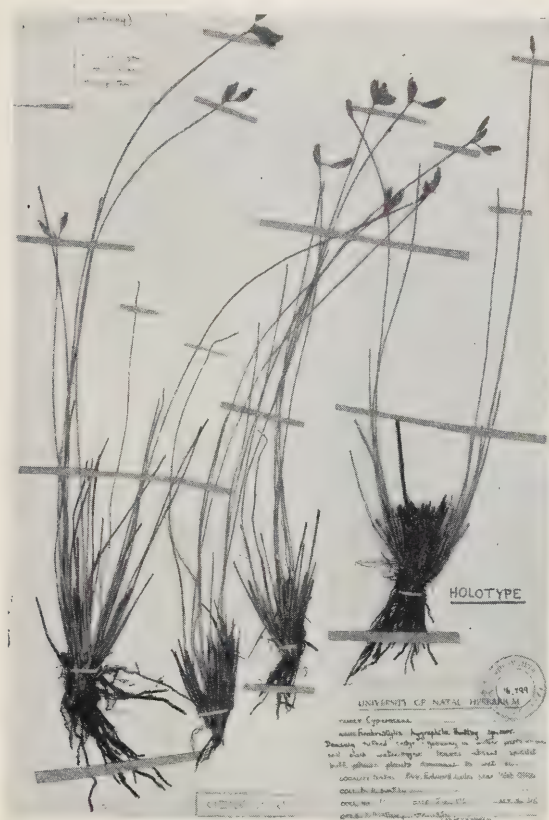
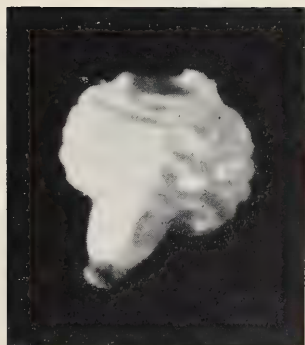


PLATE I.

Fimbristylis hygrophila
Gordon-Gray sp. nov.
holotype, Huntley 701;
below, achene ($\times 30$).



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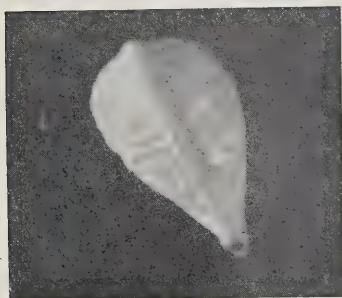
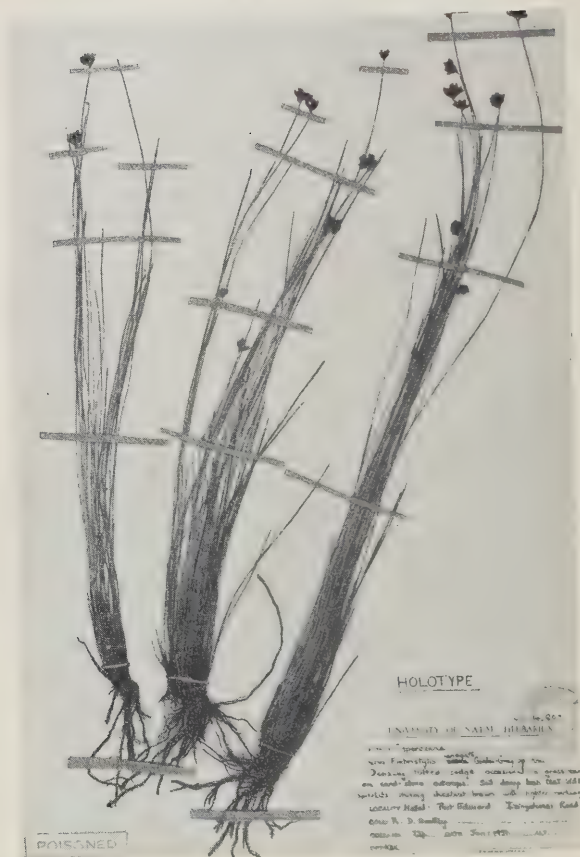


PLATE II.
Fimbristylis variegata
 Gordon-Gray sp. nov.
 holotype, Huntley 734;
 below, achene ($\times 30$).